

REMARKS

In view of the final Official Action dated 01/19/06, claim 11 has been amended so as to overcome the rejection under 35 USC § 112. Reconsideration of claims 11 – 20 under 35 USC 112 is respectfully requested.

In view of the rejection of claim 1 – 6, 8, 9, 11-16, 18 and 19 under 35 USC 102(b) as being anticipated by Friesen et al. (US 5 753 008) and the additional rejection of claims 1 – 5 under 35 USC 102(b) as being anticipated by Linder (US 5 049 282) and further the injection of claims 7, 10, 17, 20 under 103(a) as being obvious in view of Friesen et al. and Applicants' disclosure, the independent claims 1 and 11 have been amended so as to define the invention more distinctly.

The independent claims:

It has been made clear in these claims that the polyimide membrane is covalently functionalized.

This feature is disclosed on page 13, example 2, of the description.

It is stated in the example on page 14, lines 5 – 7, that "after the modification reaction, the membrane was washed thoroughly with water at room temperature to remove any modifier substances not covalently bonded to the membrane". This clearly means that all the modifier substances were covalently bonded to the membrane.

Concerning the rejection based on Friesen et al., it is noted that – unlike in connection with the present invention – in Friesen et al., a polyimide membrane is not functionalized directly by contacting it with an aqueous solution of a modifier substance, whereby the modifier substances are covalently bound to the polyimide membrane, but, a "bollow support fiber" is coated by a "perm selective coating on the surface of the support fiber", and the coating is cross-linked. In this connection, only a cover layer is deposited, dried and internally cross-linked with the addition of a cross-linking solution (solution C of the example 2 of Friesen). In Friesen et al., the heated nitrogen in step 3 of the example 2 has the function to initiate the reaction of the cross-linker present in the dried coating (solution C) so that the polymer molecules in the coating are interlinked. A covalent functionalization by a

chemical group is not disclosed in connection with the polyimide membrane, that is, the support membrane ("hollow support fiber") of Friesen et al.

Also, Linder et al. discloses a different technical teaching. There, a membrane which may consist of polyimide may first be coated by a reactive monomer/polymer. This first coating is internally cross-linked and, subsequently, a second coating, for example comprising an amine modifier is applied. The second coating is reactively bonded to the first coating. Between the polyimide membrane and the coating which includes the amine groups, there is therefore an intermediate layer. There is no covalent binding of aminic modifiers with the polyimide membrane. Consequently, also Linder et al. is basically different, that is different in principle, from the polyimide membrane according to the present invention.

The dependent claims:

On page 3 of the final action, just before point 3, the Examiner states that claim 2 – 6 correspond to claims 12 -16. However, it is noted that claims 2 and 3 do not correspond to claims 12 and 13. The respective claims therefore have not been attended to by the Examiner.

Page 4, point 5 of the official action:

The claims 7 and 17 relate to the pore sizes of the membrane. The Examiner states that the formation of pores could have been expected with a layer formation in which the solution contains water and is formed in the presence of alcohol and a cross-linking agent since both agents (water and alcohols) are pore formers. It is noted however that it cannot be derived therefrom that pores of the given size can be, or are, formed.

The Examiner's argument concerning claims 10 and 20 is not considered to be effective as polyimide membranes are not part of the state of the art. It is not said on page 11 that polyimide membrane supports are known in the art. It is rather said that polyimide membranes were formed (by Applicants) following a known manufacturing method from the polyamide Ultem 1000 which is made by General Electric Co. – which certainly does not mean that the membranes were made by General Electric Co.

Concern the examincrs points 5 and 6 (page 4, 5 of the final rejection, it is noted that the treatment with nitrogen gas in Friesen et al. does not represent a purification but serves to establish interlinks by means of the increased temperature.

The membrane is therefore not inherently cleaned in Friesen et al. as alleged by the Examiner. The compounds which are to be removed from the membrane are not volatile and can therefore not be removed by exposure to a gas flow and particularly not by an inert gas such as nitrogen.

Reconsideration and allowance of claims 1 – 20 is solicited.

Respectfully submitted,



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